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EXAMINER

WEST, JEFFREY R

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/808,499 | Applicant(s) MIYAIRI ET AL. | |
| | Examiner Jeffrey R. West | Art Unit 2857 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-85 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims withdrawn from consideration are

2,4,5,7,9,10,12,14,15,17,19,20,22,24,25,27,30,33,35,36,38,40,41,43,46,48,49,51,54,56,57,59,62,64,65,67,70,72,73,75,78,80,81 and 83.

Continuation of Disposition of Claims: Claims rejected are

1,3,6,8,11,13,16,18,21,23,26,28,29,31,32,34,37,39,42,44,45,47,50,52,53,55,58,60,61,63,66,68,69,71,74,76,77,79,82,84 and 85.

DETAILED ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "2610" (Figure 21G).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "307a to 310a" and "307b to 310b" (page 31, line 12), "1507" (page 36, line 19)
4. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in

reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

On page 11, line 14, reference should be made to Figures 18C-F.

On page 11, line 19, "FIGS. 23" should be ---FIGS. 23A to 23C---.

On page 18, lines 3 and 8, and page 19, line 7, the actual tables should be listed here, or an indication should be made that the tables are present at the end of the specification.

On page 40, lines 12-25, reference number "806" is referred to as both a "substrate" and "circuit".

Appropriate correction is required.

Claim Objections

6. Claims 1, 3, 26, 28, 45, 47, 50, 52, 84, and 85 are objected to because of the

following informalities:

In claim 1, line 5, to avoid problems of antecedent basis, "is photographed" should be ---is photographed to produce a photographed image---.

In claim 1, line 8, to avoid problems of antecedent basis, "the scanning direction" should be ---a scanning direction---.

In claim 3, line 4, to avoid problems of antecedent basis, "visible light" should be - --visible light to produce a photographed image---.

In claim 3, line 14, to avoid problems of antecedent basis, "the crystallinity" should be ---a crystallinity---.

In claim 3, line 14, "film of which" should be ---film, of which---.

In claim 3, line 15, to avoid problems of antecedent basis, "the fluctuation" should be ---a fluctuation---.

In claim 26, lines 4-5, "photographing a scattered" should be ---photographing scattered---.

In claim 26, line 5, to avoid problems of antecedent basis, "scattered light" should be ---scattered light to produce a photographed image---.

In claim 26, line 8, to avoid problems of antecedent basis, "the scanning direction" should be ---a scanning direction---.

In claim 28, lines 4-5, "photographing a scattered" should be ---photographing scattered---.

In claim 28, line 5, to avoid problems of antecedent basis, "scattered light" should be ---scattered light to produce a photographed image---.

In claims 45, 47, 50, and 52, line 2. "light to be irradiated on a surface" should be ---light irradiating on the surface---.

Claim 84 and 85 are objected to as being duplicates of parent claims 79 and 82, respectively.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 3, 6, 8, 11, 13, 16, 18, 21, 23, 28, 29, 31, 34, 37, 39, 42, 44, 47, 52, 55, 60, 61, 63, 66, 68, 71, 76, 79, and 84 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 is considered to be vague and indefinite because it recites, "testing the crystallinity of the semiconductor film of which the crystallinity is improved, by the fluctuation of the average of the luminance from the approximate line". Claim 3, however, already describes "calculating an average of luminance of the m basic units aligned in the X directions per each of the n rows aligned in the Y direction", thereby calculating an average value for each row. It is therefore unclear to one having ordinary skill in the art as to which of the row averages is referred to as "the average of the luminance" in "testing the crystallinity of the semiconductor film of

which the crystallinity is improved, by the fluctuation of the average of the luminance from the approximate line”.

Claim 6 is rejected under 35 U.S.C. 112, second paragraph, because it attempts to further limit parent claim 1 by specifying “a corrected saturation is used instead of the luminance.” Parent claim 1, however, specifically claims “calculating a luminance of the digital image” and therefore it is unclear to one having ordinary skill in the art as to the subject matter which Applicant regards as the invention since claim 6 does not further limit, but instead contradicts the limitations of claim 1.

Claims 8, 29, and 31 are also rejected under 35 U.S.C. 112, second paragraph, because they contain similar limitations.

Claim 11 is considered to be vague and indefinite because it specifies that “an average luminance in the digital image is tested altogether”. It is unclear, however, to one having ordinary skill in the art what it means to perform testing “altogether” as well as whether it is the average luminance or the digital image that is being “tested altogether”. Further, claim 1 presents a “method for testing comprising: irradiating an energy beam...irradiating a visible light...digitizing the photographed image...and calculating a luminance...” It is unclear to one having ordinary skill in the art how the limitation of “wherein an average luminance in the digital image is tested altogether” further limits parent claim 1.

Claim 13 is also rejected under 35 U.S.C. 112, second paragraph, because it contains similar limitations.

Claim 16 is considered to be vague and indefinite because it specifies that “an average saturation in the digital image is tested altogether”. It is unclear, however, to one having ordinary skill in the art what it means to perform testing “altogether” as well as whether it is the average saturation or the digital image that is being “tested altogether”. Further, claim 1 presents a “method for testing comprising: irradiating an energy beam...irradiating a visible light...digitizing the photographed image...and calculating a luminance...” It is unclear to one having ordinary skill in the art how the limitation of “an average corrected saturation in the digital image is tested altogether” further limits parent claim 1.

Claim 18 is also rejected under 35 U.S.C. 112, second paragraph, because it contains similar limitations.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, because it attempts to further limit parent claim 1 by specifying “[a] method for testing wherein two or more of methods for testing claim 1 are combined for testing.” In this limitation, it is unclear to one having ordinary skill in the art how this limitation further limits parent claim 1 and it is further unclear how “two or more methods for testing claim 1 are combined for testing” in light of the specific limitations presented in claim 1.

Claim 23 is also rejected under 35 U.S.C. 112, second paragraph, because it contains similar limitations.

Claim 28 is considered to be vague and indefinite because it recites, “testing a profile of the energy beam by a relation of the average of the luminance to a

corresponding alignment in the Y direction". Claim 28, however, already describes "calculating an average of luminance of the m basic units aligned in the X directions per each of the n rows aligned in the Y directions", thereby calculating an average value for each row. It is therefore unclear to one having ordinary skill in the art as to which of the row averages is referred to as "the average of the luminance" in "testing a profile of the energy beam by a relation of the average of the luminance to a corresponding alignment in the Y direction".

Regarding claims 37, 39, 42, and 44, the phrase "such light source as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim 61 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite because it recites "[a] semiconductor device comprising a semiconductor film tested by a method for testing according to claim 1" while claim 1 recites a "method for testing..." Therefore, claim 61 is considered to be ambiguous because attempts to further limit a method with an apparatus, thereby incorporating both product and process subject matter.

Claims 63, 66, and 68 are also rejected under 35 U.S.C. 112, second paragraph, because they contain similar limitations.

Claims 34, 47, 52, 55, 60, 71, 76, 79, and 84 are rejected under 35 U.S.C. 112, second paragraph, because they incorporate the lack of clarity present in their respective parent claims.

Claim Rejections - 35 USC § 101

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

10. Claims 61, 63, 66, and 68 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 61 is rejected under 35 U.S.C. 101, as being directed to non-statutory subject matter, because it recites “[a] semiconductor device comprising a semiconductor film tested by a method for testing according to claim 1” while claim 1 recites a “method for testing...” Therefore, claim 61 is rejected under 35 U.S.C. 101 since the claim is directed to neither a “process” nor a “machine” but rather embraces or overlaps two different statutory classes of inventions set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only.

Claims 63, 66, and 68 are also rejected under 35 U.S.C. 101, as being directed to non-statutory subject matter, because they contain similar limitations.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1, 3, 11, 13, 21, 23, 32, 34, 37, 39, 61, 63, 69, 71, 77, 79, and 84, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,975,386 to Tsumura et al. in view of U.S. Patent No. 6,647,148 to Ozawa et al. and further in view of U.S. Patent Application Publication No. 2005/0041226 to Tanaka et al.

With respect to claim 1, Tsumura discloses a method for testing comprising irradiating an energy beam to a semiconductor film to improve a crystallinity (column 7, lines 12-20), irradiating a visible light on a surface of the semiconductor film of which the crystallinity is improved (column 3, lines 46-53) and a scattered light is received and photo-transferred to form an image (column 10, lines 41-53), and analyzing regions of the image to discriminate regions of luminance (column 10, lines 1-12).

With respect to claim 3, Tsumura discloses a method for testing comprising irradiating a visible light on a surface of a semiconductor film (column 3, lines 46-53) of which the crystallinity is improved by irradiating an energy beam (column 7, lines 12-20), photo-transferring a scattered light of the irradiated visible light to form an image (column 10, lines 41-53), and analyzing regions of the image to discriminate regions of luminance (column 10, lines 1-12).

With respect to claims 21, 23, 69 and 71, Tsumura discloses combining two or more of methods for testing by testing each of a plurality of semiconductor films crystallized by an energy beam (column 9, lines 48-57) having a different density

(column 11, lines 53-58) and determining an irradiation energy density by a result of the testing to crystallize a semiconductor film (column 12, lines 10-18).

With respect to claims 32 and 34 Tsumura discloses that the energy beam is a laser light (column 12, lines 16-18).

With respect to claims 37 and 39 Tsumura discloses that the visible light has such light source as a halogen lamp (column 10, lines 57-62).

With respect to claims 61 and 63, Tsumura discloses a semiconductor device comprising a semiconductor film tested by the corresponding method (column 3, lines 46-53).

Tsumura also discloses a method for testing a beam profile comprising irradiating an energy beam on a substrate on which an amorphous semiconductor film (column 4, lines 62-66) is formed (column 7, lines 12-20), irradiating a visible light on a surface of the substrate (column 3, lines 46-53) and photo-transferring the scattered light to form an image (column 10, lines 41-53), and analyzing regions of the image to discriminate regions of luminance (column 10, lines 1-12) to test a profile of the energy beam (column 9, lines 48-57, column 11, lines 53-58, and column 12, lines 10-18).

As noted above, the invention of Tsumura teaches many of the features of the claimed invention and while the invention of Tsumura does teach determining defects caused by changes in observed luminance/intensity reflectance in a surface image (column 7, line 55 to column 8, line 13 and column 10, lines 1-12), Tsumura

does not include the specifics on how the image discriminator determines locations of the defects.

Ozawa teaches a boundary line detecting method to determine areas with differences in light reflectance on a device surface (column 5, lines 12-17) comprising a camera to take a photograph of reflected light (column 6, lines 5-9), digitizing the photographed image to make a digital image (column 7, lines 63-65), and calculating an average luminance of the digital image (column 8, lines 16-20) by a computer (column 5, lines 60-63), sectioning $m \times n$ basic units by dividing the digital image into m in the X direction and n in the Y direction in a predetermined analysis region (column 7, lines 25-31 and 59-63 and Figure 4A), calculating/testing an average of luminance of the m basic units altogether aligned in the X directions per each of the n rows aligned in the Y direction (column 8, lines 16-20), obtaining an approximate line of a relation of the average of the luminance to a corresponding alignment in the Y direction, and testing the device surface by the fluctuation of the average of the luminance from the approximate line (column 8, lines 3-20 and Figure 4C).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura to include the specifics on how the image discriminator determines locations of the defects, as taught by Ozawa, because Ozawa suggests a corresponding method for determining borders caused by variations in brightness (column 5, lines 12-17), as applicable to the defect detection invention of Tsumura, that would have improved the accuracy of the defect detection by employing a

method that is not limited by the arrangement of the photodetectors of the detection apparatus (column 2, lines 55-61).

As noted above, the invention of Tsumura and Ozawa teaches many of the features of the claimed invention and while the invention of Tsumura and Ozawa does teach calculating an average of luminance of the m basic units aligned in the X directions per each of the n rows aligned in the Y direction of a surface scanned by an energy beam, the combination does not explicitly indicate that the measurement is to be performed in a direction perpendicular to the scanning direction of the light.

Tanaka teaches a method and device for exposure control comprising scanning reticle stage in an x -direction using a light source (0129, lines 1-13), receiving reflected light (0131, lines 1-7) and measuring a distribution of luminance (0321, lines 1-8) wherein the measurement is performed in a direction perpendicular to the scanning direction of the light (0322, lines 1-5).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura and Ozawa to explicitly indicate that the measurement is to be performed in a direction perpendicular to the scanning direction of the light, as taught by Tanaka, because, as suggested by Tanaka, the combination would have improved the measurement of Tsumura and Ozawa by canceling any irregularity of luminance measured in the scanning direction caused by the scanning itself (0322, lines 1-5).

With respect to claims 77, 79, and 84 since the invention of Tsumura teaches performing testing by employing a plurality of components in a crystallization

chamber/container (column 6, lines 53-54) and the invention of Ozawa teaches including a means for photographing the scattered light as part of the components for testing, the combination would have provided a means for photographing the scattered light in a crystallization chamber.

13. Claims 45, 47, 53, and 55, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsumura et al. in view of Ozawa et al. and Tanaka and further in view of U.S. Patent Application Publication No. 2003/0142298 to Ujihara et al.

As noted above, Tsumura in combination with Ozawa and Tanaka teaches many of the features of the claimed invention and while the invention of Tsumura, Ozawa, and Tanaka does teach applying a visible light to the surface of a semiconductor film, the visible light being the light from a halogen source, the combination does not specify the output of the halogen source.

Ujihara teaches an inspection method and inspection system of a surface of an article through the inspection of a photographed image of its surface (0002, lines 1-3) in order to determine the illumination variations of the surface, wherein the surface is illuminated by a light source (0009, lines 1-13) such as a halogen lamp with an intensity of 20,000 to 100,000 lux (0052, lines 1-9).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura, Ozawa, and Tanaka to specify a corresponding output of the halogen source, as taught by Ujihara, because the combination of Tsumura, Ozawa

and Tanaka does teach implementing a halogen light source and Ujihara suggests a corresponding intensity range suitable for a halogen lamp to carry out the inspection of Tsumura, Ozawa, and Tanaka (0052, lines 1-9).

14. Claims 26, 28, 42, 44, 66, 68, 74, 76, 82, and 85, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsumura et al. in view of Ozawa et al. and Tanaka and further in view of U.S. Patent No. 6,861,614 to Tanabe et al.

As noted above, Tsumura in combination with Ozawa and Tanaka teaches many of the features of the claimed invention and while the invention of Tsumura, Ozawa, and Tanaka does teach a method for testing a beam profile by irradiating a laser energy beam on a substrate on which an amorphous semiconductor film is formed, the combination does not specify that the laser is applied as a pulse.

Tanabe teaches an S-System for the formation of a silicon thin film and a semiconductor-insulating film interface comprising performing laser-induced crystallization using a laser pulse (column 2, lines 1-14 and column 20, line 60 to column 21, line 10).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura, Ozawa, and Tanaka to specify that the laser is applied as a pulse, as taught by Tanabe, because the combination, as suggested by Tanabe, would have provided a conventional method to enable one having ordinary skill in the art to carry out the crystallization improvement of Tsumura, Ozawa, and Tanaka

thereby providing results in accordance with convention (column 2, lines 1-14 and column 20, line 60 to column 21, line 10).

15. Claims 50, 52, 58, and 60, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsumura et al. in view of Ozawa et al., Tanaka, and Tanabe and further in view of U.S. Patent Application Publication No. 2003/0142298 to Ujihara et al.

As noted above, Tsumura in combination with Ozawa, Tanaka, and Tanabe teaches many of the features of the claimed invention and while the invention of Tsumura, Ozawa, Tanaka, and Tanabe does teach applying a visible light to the surface of a semiconductor film, the visible light being the light from a halogen source, the combination does not specify the output of the halogen source.

Ujihara teaches an inspection method and inspection system of a surface of an article through the inspection of a photographed image of its surface (0002, lines 1-3) in order to determine the illumination variations of the surface, wherein the surface is illuminated by a light source (0009, lines 1-13) such as a halogen lamp with an intensity of 20,000 to 100,000 lux (0052, lines 1-9).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura, Ozawa, Tanaka, and Tanabe to specify a corresponding output of the halogen source, as taught by Ujihara, because the combination of Tsumura, Ozawa, Tanaka, and Tanabe does teach implementing a halogen light source and Ujihara suggests a corresponding intensity range suitable for a halogen

lamp to carry out the inspection of Tsumura, Ozawa, Tanaka, and Tanabe (0052, lines 1-9).

16. Claims 6, 8, 16, and 18, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsumura et al. in view of Ozawa et al. and Tanaka et al. and further in view of U.S. Patent Application Publication No. 2004/0228526 to Lin et al.

As noted above, Tsumura in combination with Ozawa and Tanaka teaches many of the features of the claimed invention and while the invention of Tsumura, Ozawa, and Tanaka does teach measuring an average luminance of an image to determine variations of a surface illuminated by a multi-color light source (Tsumura; column 10, lines 57-59), the combination does not specify determining a corrected saturation value for the image rather than the luminance.

Lin teaches a system and method for color characterization using fuzzy pixel classification with application in color matching and color match location comprising means for inspecting a surface of an object (0003, lines 7-12) by dividing an image into regions of interest (0038, lines 1-12) and measuring a saturation value for the image (0112, lines 1-15) that has been corrected/normalized to a range from 0 to 255 (0110, lines 8-11).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura, Ozawa, and Tanaka to specify determining a corrected saturation value for the image rather than the luminance, as taught by Lin, because

the invention of Tsumura, Ozawa, and Tanaka does teach measuring an average luminance of an image to determine variations of a surface illuminated by a multi-color light source and Lin suggests a corresponding method that would have improved the inspection method of Tsumura, Ozawa, and Tanaka by determining saturation values useful in inspecting colored surfaces, such as the surface colored by the multi-color light source of Tsumura, Ozawa, and Tanaka, and provided increased accuracy in surface inspection by measuring saturation values that provide more information regarding color variations (0004, lines 1-10 and 0006, line 1 to 0007, line 8).

Further, since the invention of Tsumura, Ozawa, and Tanaka teaches measuring a luminance and calculating/testing altogether an average from the measured luminance values and Lin teaches measuring a corrected saturation in place of the luminance, the combination would have calculated/tested altogether an average from the corrected saturation values.

17. Claims 29 and 31, as may best be understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsumura et al. in view of Ozawa et al., Tanaka et al., and Tanabe and further in view of U.S. Patent Application Publication No. 2004/0228526 to Lin et al.

As noted above, Tsumura in combination with Ozawa, Tanaka, and Tanabe teaches many of the features of the claimed invention and while the invention of Tsumura, Ozawa, Tanaka, and Tanabe does teach measuring an average

luminance of an image to determine variations of a surface illuminated by a multi-color light source (Tsumura; column 10, lines 57-59), the combination does not specify determining a corrected saturation value for the image rather than the luminance.

Lin teaches a system and method for color characterization using fuzzy pixel classification with application in color matching and color match location comprising means for inspecting a surface of an object (0003, lines 7-12) by dividing an image into regions of interest (0038, lines 1-12) and measuring a saturation value for the image (0112, lines 1-15) that has been corrected/normalized to a range from 0 to 255 (0110, lines 8-11).

It would have been obvious to one having ordinary skill in the art to modify the invention of Tsumura, Ozawa, Tanaka, and Tanabe to specify determining a corrected saturation value for the image rather than the luminance, as taught by Lin, because the invention of Tsumura, Ozawa, Tanaka, and Tanabe does teach measuring an average luminance of an image to determine variations of a surface illuminated by a multi-color light source and Lin suggests a corresponding method that would have improved the inspection method of Tsumura, Ozawa, Tanaka, and Tanabe by determining saturation values useful in inspecting colored surfaces, such as the surface colored by the multi-color light source of Tsumura, Ozawa, Tanaka, and Tanabe, and provided increased accuracy in surface inspection by measuring saturation values that provide more information regarding color variations (0004, lines 1-10 and 0006, line 1 to 0007, line 8).

Further, since the invention of Tsumura, Ozawa, Tanaka, and Tanabe teaches measuring a luminance and calculating/testing altogether an average from the measured luminance values and Lin teaches measuring a corrected saturation in place of the luminance, the combination would have calculated/tested altogether an average from the corrected saturation values.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent No. 5,835,614 to Aoyama et al. teaches an image processing apparatus.

U.S. Patent No. 5,091,963 to Litt et al. teaches a method and apparatus for inspecting surfaces for contrast variations.

U.S. Patent No. 6,836,532 to Durst et al. teaches a diffraction system for biological crystal screening.


19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)272-2216. The fax phone number

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for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrey R. West
Examiner – AU 2857

January 23, 2006